Appendix E: Congestion Management Strategies Analysis

WASATCH FRONT REGIONAL COUNCIL
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TO: Kurt Overcast

FROM: Kip Billings

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SUBJECT: SR-201: Jordan River to Western Transportation Corridor - CMS Justification and Recommendations

Enclosed is a copy of the CMS justification for the above project. The need for additional capacity is demonstrated, and alternative strategies are shown not to meet future demand. There are also recommendations for TSM and TDM strategies appropriate to incorporate into widening projects for freeways, as well as a few points to emphasize for this project in particular.

Please call if questions or concerns arise.

Project: **2100 South Freeway (Jordan River – Western Transportation Corridor)**
6 lanes, Principal Arterial

Corridor: **2100 South Freeway (5600 West - I-15)**

Need for Additional Capacity:

Growth rates for the Wasatch Front Region are high, with projected increases in population and employment of about 68 and 83 percent, respectively by the year 2030. Most of this growth will consist of multiple automobile households and relatively low density residential development, combined with continued dispersed employment. The trip making characteristics of this growth will be characterized primarily by the socioeconomic characteristics of the households and not by the transportation supply or infrastructure improvement. Specifically, there are more trips per household than in the past. This will impact vehicle miles of travel in the Wasatch Front region which are projected to grow by approximately 86 percent over the next 30 years.

As shown in the attached table, the 1996 PM period volume to capacity (V/C) ratio on SR-201 in the corridor ranges from 0.54 to 0.90. By definition a V/C greater than 1.0 is not possible. When the travel demand models assign more volume than capacity available, it indicates that the demand exceeds carrying ability. Consequently, peak speeds drop and commuters begin traveling to and from work earlier or later than they used to, resulting in peak spreading. Assuming, as discussed below, that system management and demand management strategies are put in place region wide, the 2030 PM period V/C ratio along SR-201 would be 1.10 which exceeds the LOS "D" design value V/C ratio of 0.84. Since this combination of demand and system management strategies will not prevent significant congestion and delays, additional capacity is needed.

Effectiveness of Alternative Strategies:

As required by federal regulations, all reasonable alternatives to adding capacity must be evaluated and shown to not sufficiently alleviate congestion before SOV capacity may be added. A summary of this evaluation follows. Access control on SR-201 is already in place. Signal coordination is not applicable for interstate routes. Incident management strategies to mitigate nonrecurring congestion caused by incidents are beneficial to reduce the duration of nonrecurring delay, but these measures do not increase the effective capacity of the facility to satisfy daily travel demand. Ramp metering is effective in protecting premature loss of effective capacity in merge sections. Ramp metering is credited with increasing PM peak freeway capacity to 23,300. Upgrading existing interchanges will improve capacity within the interchange section, but does not change the capacity of the freeway sections between interchanges.

On the demand management side, the projected 2030 volumes in the attached table reflect the less than two percent of trips removed by transit improvements and rideshare. Staggered and flexible work hours do not remove trips, but rather spread out the peak period. Ultimately, this does not solve congestion, because traffic grows to fill up the available capacity until congestion lasts through much of the day. The VMT reductions derived from existing trip reduction ordinances have already been reflected in the other strategies discussed.

Functional Class Clarifications:

SR-201 is functionally classified as a principal arterial. As one of a limited number of Wasatch Front area east-west principal arterials with grade separation and full access control, it needs to serve long trip lengths at high speeds. Therefore, it is critical to manage the facility as effectively as possible through geometric design, use of alternative modes, and ITS technologies. The following congestion management strategies are applicable to the SR-210 principle arterial corridor.

ITS and Incident Management:

Conduit must be provided to facilitate integration of this facility with the ATMS in Salt Lake Valley. Variable message signs need to be provided at the Hinckley Drive interchange.

Ramp Metering:

Should not be precluded and should be implemented when volumes warrant.

Interchange Improvements:

Interchanges should be upgraded to improve traffic flow and accessibility.

Transit Improvements:

Coordinate with UTA and local jurisdictions to preserve right-of-way for park-and-ride lots at effective locations.

HOV Lanes:

Use of the inner lane in each direction must be analyzed for potential HOV use. If a time savings of 6 or more minutes on peak period trips of 10 miles is predicted, the inner lane should be designated for HOV use during peak periods. HOV bypass ramps should be implemented.

Walk / Bicycle:

Safe and effective passage for these modes must be considered within and across the corridor.

SR-201 (Jordan River - Western Transportation Corridor)

Freeway

Street	From	To	Present PM* Capacity (2 lanes, both directions, 3 hours)	1996 PM* Volume (both directions, 3 hours)	Projected 2030 PM* Volume** (both directions, 3 hours)	v/c 1996	v/c 2030
SR-201	Jordan River	I-215	22,800	20,453	20,556	0.90	0.90
SR-201	I-215	Bangerter Hwy.	22,800	18,260	25,358	0.80	1.11
SR-201	Bangerter Hwy.	WTC	22,800	12,221	26,223	0.54	1.15
Average			22,800		25,791	0.78	1.07

TSM Improvements	Capacity Increase	New Capacity	Net Capacity	New v/c
Ramp Metering	--	500		
			23,300	25,791	1.11

TDM Improvements	Volume Reduction	Reduced Volume	Net Volume	New v/c
Transit Improvements	1.00%	258		
ECO/Carpools/Vanpools	0.43%	111		
			23,300	25,533	1.10

* PM Period is 3:00 PM to 6:00 PM. Modeled volume adjusted by 1996 UDOT/Model ratio.

** Volume projection assumes no capacity increase beyond 2001.